THIS OPINION WAS NOT WRITTEN FOR PUBLICATION

The opinion in support of the decision being entered today (1) was not written for publication in a law journal and (2) is not binding precedent of the Board.

Paper No. 11

UNITED STATES PATENT AND TRADEMARK OFFICE

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BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

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Ex parte ROGER E. NEFF
and RODERICK G. RYLES

_____

Appeal No. 1996-2115
Application 08/180,933[1]

_____

ON BRIEF

_____

Before DOWNEY, WILLIAM F. SMITH and LORIN, Administrative Patent Judges.

DOWNEY, Administrative Patent Judge.

DECISION ON APPEAL

This is an appeal under 35 U.S.C. § 134 from the final rejection of claims 1, 4-5, 8, 10, 13, 23, 26-27 and 29, all of the claims pending in the application. The subject matter on appeal is directed to highly branched, water-soluble, high molecular weight

[1] Application for patent filed January 11, 1994. According to the appellants, the application is a continuation of Application 07/643,309, filed January 22, 1991, abandoned; which is a continuation of Application 285,931, filed December 19, 1988, abandoned.

polymeric microparticles. Claim 1 is directed to polymeric microparticles which are anionic or cationic and claim 23 is directed to polymeric microparticles which are non-ionic.

Claims 1, 4-5, 8, 10, 13, 23, 26-27 and 29 read as follows:

1. Highly branched, water-soluble, high molecular weight cationic or anionic polymeric microparticles wherein said microparticles have an average unswollen diameter of less than about 0.1 micron, a solution viscosity of at least about 2.0 mPa.s and having a methylenebisacrylamide content of from 2 to 80 molar parts per million based on the monomeric units present in the polymer, said microparticles having a solubility quotient greater than about 30 percent, said polymer being comprised of an acrylamide and a comonomer selected from the group consisting of diallyldimethylammonium chloride; acryloxyethyltrimethylammonium chloride; quaternaries of N,N-dialkylaminoalkyl(meth)acrylamides; (meth)acrylamidopropyltrimethylammonium chloride; (meth)acrylic acid, [sic] styrene sulfonic acid; itaconic acid; 2-acrylamido-2-methylpropanesulfonic acid; sulfoalkyl(meth)acrylic acid; salts of the above acids and sulfomethylated(methyl)acrylamides.

4. Polymeric microparticles as defined in Claim 1 wherein said solution viscosity is at least about 2.2 mPa.s.

5. Polymeric microparticles as defined in Claim 1 wherein said solution viscosity is at least about 2.4 mPa.s.

8. Polymeric microparticles as defined in Claim 1 wherein said comonomer consists of acryloxyethyltrimethylammonium chloride.

10. Polymeric microparticles as defined in Claim 1 wherein said comonomer consists of salt of acrylic acid.

13. Cationic polymeric microparticles as defined in Claim 1 wherein said solubility quotient is greater than about 40 percent.

23. Highly branched, water-soluble, high molecular weight, non-ionic polymeric microparticles wherein said microparticles have an average unswollen diameter of less than 0.1 micron, a solution viscosity of at least 2.0 mPa.s and a methylenebisacrylamide content of from 2 to 80 molar parts per million based on the monomeric units present in the polymer, said units comprising those of an acrylamide, an N-alkylacrylamide, an N,N-dialkylacrylamide, N-vinylmethylformamide, or N-vinyl pyrrolidone.

26. Polymeric microparticles as defined in Claim 23 wherein said solution viscosity is at least about 2.2 mPa.s.

27. Polymeric microparticles as defined in Claim 26 wherein said solution viscosity is at least about 2.4 mPa.s.

29. Polymeric microparticles as defined in Claim 23 comprising acrylamide homopolymer.

The references relied upon by the examiner are:

Flesher et al. (Flesher)	4,720,346	Jan. 19, 1988
Morgan et al. (Morgan)	3,968,037	Jul. 06, 1976
Zweigle et al. (Zweigle)	4,172,066	Oct. 23, 1979
Candau et al. (Candau)	4,521,317	Jun. 04, 1985

The rejections before us are:

I. Claim 29 stands rejected under 35 U.S.C. § 112, second paragraph.[2]

[2] Appellants' brief listed claims 1, 4, 5, 8, 10, 13, 23, 26, 27 and 29 as rejected under 35 U.S.C. § 112, second paragraph (brief, page 3). The examiner, in his answer, withdrew the rejection of claim 1 as being indefinite and was silent as to the status of claims 4, 5, 8, 10,13, 23, 26 and 27 (answer, page 2) but maintained his rejection of claim 29. The examiner noted that only claim 29 stands rejected under 35 U.S.C. § 112, second paragraph (answer, page 3). Accordingly, we treat claim 29 as the only claim rejected under 35 U.S.C. § 112, second paragraph.

II. Claims 1, 4, 5, 8, 10, 13, 23, 26, 27 and 29 stand rejected under 35 U.S.C. § 103 as being obvious over Flesher and Morgan.

III. Claims 23, 26, 27 and 29 stand rejected under 35 U.S.C. § 103 as being obvious over Candau and Zweigle.

Opinion

After careful consideration of the rejections before us, the prior art, the arguments presented by appellants and the examiner, as well as the evidence, we reverse rejections I and II; and we affirm rejection III.

35 U.S.C. § 112, second paragraph, rejection

The test for definiteness is whether one skilled in the art would understand the bounds of the claim when read in light of the specification. Miles Lab., Inc. v. Shandon Inc., 997 F.2d 870, 875, 27 USPQ2d 1123, 1126 (Fed. Cir. 1993). If the claims read in light of the specification reasonably apprise those skilled in the art of the scope of the invention, § 112 demands no more Id.

As to claim 29, the examiner contends that the phrase “acrylamide homopolymer” is inconsistent with claim 23 because claim 23 requires the presence of at least 2 molar parts per million of methylene-bis-acrylamide (MBA) comonomer (answer, pages 3-4).

We agree with appellants that the term “acrylamide homopolymer” as used in claim 29 reasonably apprises one of ordinary skill in the art that the scope of the invention is an acrylamide polymer which is branched with methylenebisacrylamide (MBA). We note that

examples 15-17, on page 20 of the specification, refer to the production of "acrylamide homopolymers" branched with MBA. Accordingly, we will not sustain the rejection of claim 29 under 35 U.S.C. 112, second paragraph.

35 U.S.C. § 103 rejections

A

Claims 1, 4, 5, 8, 10, 13, 23, 26, 27 and 29 stand rejected under 35 U.S.C. § 103 as being unpatentable over Flesher and Morgan. We reverse this rejection.

In the parent application, Serial No. 07/643,309, claims 1 and 4-13 were rejected under 35 U.S.C. § 103 over Flesher. The Board affirmed this rejection (Appeal No. 93-0557) on November 23, 1993 (Paper No. 10) and in that decision concluded that the evidence of nonobviousness did not outweigh the evidence of obviousness. The Board stated that "to the extent appellants rely upon the results set forth in Table 1 as evidence of nonobviousness, we point out that comparative Examples 1 through 6 do not state the particle size of the particles in those emulsion. Thus, this evidence is of little value." (Board decision, paragraph bridging pages 6-7). Now, appellants, in the continuation application before us explain that the emulsions of Examples 1˙ - 6˙ have particle sizes of about 1.0 micron (brief, page 11 referring to page 16, lines 1-3 of specification).

Upon presentation of new facts, it is necessary to consider the evidence of obviousness relied upon by the examiner and to weigh such evidence anew against the evidence of nonobviousness relied upon by the appellants. In re Johnson, 747 F.2d 1456, 1460, 223 USPQ 1260, 1263 (Fed. Cir. 1984).

The examiner asserts that "Examples 1˙- 6˙ fail to demonstrate unexpected results over Flesher. **These examples fail to specify any particle size information**. As stated by the Board of Patent Appeals in the patent application, these examples are of little probative value" (answer, page 11). It is clear from this statement that the examiner has not considered the evidence presented in Table 1 in light of appellants' statement that the particle size of comparative emulsions 1˙ - 6˙ is 1.0 micron. This is error. In re Hedges, 783 F.2d 1038, 1039, 228 USPQ 685, 686 (Fed. Cir. 1986).

The data show that the polymers formed using the emulsion polymerization procedure (reverse phase polymerization) of Examples 1*-6*, which appear to be representative of Flesher, do not have the claimed solution viscosity (S.V.) and the solubility quotient (CEQ). At this point the burden shifts to the examiner to explain why the data does not provide a sufficient rebuttal of the prima facie case. Absent a fact based explanation from the examiner why the data in Table 1 does not constitute an effective rebuttal, the examiner has not sustained his burden. Accordingly, we reverse this rejection.

B

Claims 23, 26-27, and 29 stand rejected under 35 U.S.C. § 103 as being unpatentable over Candau and Zweigle. We affirm this rejection.

Candau teaches nonionic polymeric microparticles, useful in enhanced oil recovery, made by polymerizing acrylamide and MBA to form a microlatex, having a diameter radius less than 50 nm (particle diameter of .025 microns) (column 1, lines 19-20 and column 2, lines 18-61). Candau discloses that the polymeric microparticles have a high molecular weight generally above 1,000,000 (column 2, lines 49-50). Candau further teaches the viscosity of the system is low (column 2, lines 33-36 and column 4, lines 35-40).

Candau fails to expressly describe the amount of MBA to be added to the polymeric microparticles. In addition, Candau fails to directly teach that the solution viscosity of the microparticles is at least about 2.0 mPa.s. Finally, Candau is silent as to whether the polymeric microparticles are water-soluble.

Zweigle, like Candau, is directed to polymeric microparticles useful in enhanced oil recovery operations (column 2, lines 25-28 and 45-50). Zweigle adds MBA (a cross-linking agent) during the formation of polymeric microparticles from monomers such as acrylamide in an amount that is sufficient to cross-link the polymer to form a discrete, spheroidal, water-swellable microgel (column 4, lines 1-20), i.e., the amount

of MBA is a result effective variable. The discovery of an optimum value of a result effective variable is ordinarily considered to be within the skill of the art. In re Boesch, 617 F.2d 272, 276, 205 USPQ 215, 219 (CCPA 1980). One of ordinary skill in the art would have found it obvious to optimize the amount of MBA used in Candau guided by the disclosure of Zweigle as to its function in creating a cross-linked final product.

As for the solution viscosity requirement of at least about 2.0 mPa.s, we note that Candau expressly teaches that the viscosity should be low so that the polymerization takes place in the micelles (column 4, lines 35-40). Accordingly, one of ordinary skill in the art at the time the invention was made would have recognized the effect that the solution viscosity has on the polymerization process. Therefore, one of ordinary skill in the art would have routinely optimized the solution viscosity of the polymer to assure the polymerization occurs in the micelles. Id.

As to the question of water solubility, appellants argue that Candau is directed solely to the preparation of water-insoluble polymers (brief, page 8). However, the evidence of record does not support appellants' position. Claim 23 requires the presence of MBA in an amount of from 2 to 80 molar parts per million. According to claim 23, polymeric microparticles having this content of MBA would be water-soluble as this term is used in the present invention.

As seen from Example 2 of Table I of the present specification, a content of MBA of

3.9 molar parts per million is equivalent to a 5 weight parts per million of MBA and results in a water-soluble product. With this in mind, we refer to Zweigle which discloses microgels which comprise acrylamide and MBA wherein the MBA may be present in an amount as low as 5 weight parts per million weight parts of total monomers (column 4, lines 10-19). Although these microgels are described as water-swellable by Zweigle, they are products which would be described as water-soluble in the present invention. Thus, appellants' argument that microgels are necessarily water-insoluble is incorrect. The evidence of record establishes that the same product can be termed "water-swellable" (Zweigle) or "water soluble" (present invention). It is a matter of semantics as to whether the microgels of Candau are termed "water swellable", "water-soluble" or "water insoluble." There is no clear line of demarcation between these states as argued by appellants.

Accordingly, we find no error in the examiner's conclusion of prima facie obviousness.

We have carefully considered the evidence of non-obviousness relied upon by appellants but do not find that it outweighs the evidence of nonobviousness.

Appellants argue that Table 2 shows that Examples 1-6 outperform Comparative example 1A• (Brief, page 9). The burden of showing unexpected results rests on the proponent of the evidence. In re Klosak, 455 F.2d 1077, 1080, 173 USPQ 14, 16 (CCPA 1972). In submitting evidence to establish unobvious results, there is a burden on

appellants to indicate how the examples urged to represent the claimed invention relate to the examples intended to represent the prior art and, particularly to indicate how those latter examples represent the closest prior art. Ex parte Gelles 22 USPQ2d 1318, 1319 (Bd. Pat. App. & Int. 1992).

In this case, the showing does not compare with the closest prior art, Candau. In re DeBlauwe, 736 F.2d 699,705, 222 USPQ 191,196 (Fed. Cir. 1984). Comparative example 1A• is not a proper comparison with Candau since it does not contain MBA. Since Candau clearly and unambigously discloses microgels containing acrylamide and MBA, appellants' burden is to show that the amount of MBA used in the present invention provides an unexpected result. Appellants' use of a relatively small amount of MBA which results in a "water-soluble" product may not be considered unexpected in light of Zweigle's disclosure of the role MBA plays in the final properties of the polymer. Thus, appellants have failed to provide a basis upon which to conclude that Examples 1-6 provide evidence of unexpected results.

Accordingly, the rejection is affirmed.

In summary, the rejection of claim 29 under 35 U.S.C. § 112, second paragraph is reversed. The rejection of claims 1, 4, 5, 8, 10, 13, 23, 26, 27 and 29 under 35 U.S.C. § 103 under Flesher in view of Morgan is reversed. The rejection of claims 23, 26, 27 and 29 under 35 U.S.C. § 103 under Candau in view of Zweigle is affirmed.

No time period for taking any subsequent action in connection with this appeal may be extended under 37 C.F.R. § 1.136(a).

AFFIRMED-IN-PART

MARY F. DOWNEY Administrative Patent Judge	)
WILLIAM F. SMITH Administrative Patent Judge	) BOARD OF PATENT) APPEALS AND) INTERFERENCES
HUBERT C. LORIN Administrative Patent Judge	)

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